

## Idaho's Rare Lichens

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### Introduction

I would like you to look closer at trees and on the ground for lichens! Yes, lichens are often found in the forest canopy and on the ground. You don't have to climb trees. You can find windblown trees or fallen tree limbs and find lichens there. Canopy lichens and mosses exist in different "zones" within the forest canopy. The lowest zone is the bryophyte zone, followed by the cyano-lichen zone, the forage lichens, and then the leafy arboreal lichen zone on the top.

I will present these rare lichens arranged by their general habitats: 1) forest, 2) rock outcroppings, 3) rangeland, and 4) alpine.

#### 1) Forest Lichens:

One group of rare forest lichens that I want to talk about is the *Caliciales*. They are small lichens on short stalks; some species are unlichenized. They look like very minute mushrooms. They are in the same order as the former federal candidate lichen, *Texosporium*. *Caliciales* have asci formed in cups (apothecia). The asci disintegrate and the paraphyses (sterile hyphae) wrap around the spores. This group is closely associated with old-growth forests. In North America we don't know which *Caliciales* are common or rare, though: part of this is because much of their prime substrate, old growth trees, were cut before they were studied. There still has been little work done on this group in Western North America.

Another group, the "forage lichens" are eaten by wildlife. One of these is a rare species, *Bryoria tortulosa*. It is very light, almost golden color, found in the lower Clearwater River basin. Two localities are known in Idaho. One is a narrow elevational band in the lower Clearwater, downstream from Lowell, Idaho, occurring on ponderosa pine. The habitat is dry effective soil but the air is humid. In the winter, the habitat is subject to maritime humidity. The second site in Idaho is an even narrower elevation band of less than 1 km along the Little Salmon River.

Other rare forest lichens include some of the leafy arboreal lichens. *Cetraria subalpina* which occurs on woody substrates in subalpine habitats that are usually wet. There are three known sites in Idaho, one on the summit of Mount Gisborne west of Priest River Experimental Station, and two on the Powell Ranger District.

*Hypogymnia inactiva* and *Platismatia stenophylla* are also rare or uncommon in Idaho. They are both found only in Northern Idaho. *Cetraria pallidula*, a yellow lichen with laminal apothecia, most frequently found on *Larix* is also uncommon in the forests of northern Idaho.

There are several rare black gelatinous lichens. One is *Collema curtisporum*. It has reddish brown apothecia. It occurs on trees, but not conifers like a lot of other boreal lichens; it is found on hardwoods, usually cottonwoods, in low elevation forests. Low elevation forests are usually more productive, warmer and therefore, most have been harvested. So there are a limited number of sites remaining. There are three known sites in Idaho for *Collema curtisporum*. Another rare gelatinous lichen that may occur with the above species on cottonwood trees is *Collema furfuraceum*. More inventory for this species is needed before its range can truly be evaluated.

Another rare lichen that can be found on large old cottonwood trees is the Oregon lettuce lichen, *Lobaria oregana*. It has only been collected once in Idaho to date, on the shore of Priest Lake. We made an unsuccessful attempt to relocate the site in 1995. This species is bright green and resembles lettuce with lobate margins. It was originally found during an osprey nest survey. *Lobaria hallii* is grayer in color than *L. oregana* and it stays gray when moist. You can find it on the North Fork of the Coeur d'Alene River at low elevations on hardwoods (cottonwoods). Unfortunately the highway department has removed most of these trees. Very few large cottonwoods remain along that section of road. When dry, *Lobaria scrobiculata* looks similar to *L. hallii*, but becomes bluer in color when wet. It has circular spots called soredia. The only known location for *Lobaria scrobiculata* in the interior Pacific Northwest is along the main Salmon River. It occurs intermittently between Barth Hot Springs and the confluence of the South Fork of the Salmon River. West of the Cascade Mountains *Lobaria scrobiculata* is common on wood, however on the east side it occurs on rock. It switches substrate, a little like fungi that switch their mycorrhizal host.

*Lobaria* are important in forest ecosystems because of their nitrogen fixing capability. Another large, nitrogen-fixing lichen is *Pseudocyphellaria anthraxis*, which has small white spots on the underside. These false holes or pseudocyphellae are visible without a hand lens. This species is common west of the Cascades but it is uncommon in Idaho. It is associated with old growth forests but does not appear rare enough to warrant a position on Idaho's rare list at the present time.

The forests also contain several rare, black gelatinous lichen species. The genus *Cladonia* or "reindeer lichen" includes several rare species. One of these is *C. borealis*, which has large gray/green stalks. *Cladonia luteoalba* grows epiphytically on *C. borealis* (Stenroos 1990) on the Middle Fork of the Salmon River at a very moist, sheltered, mid-elevation site. At the same locality, *Thamnolia vermicularis*, typically an arctic alpine species

commonly known as “white worm lichen,” can also be found. *Thamnolia* prefers moist alpine sites, and much of Idaho’s alpine is arid and windswept. The moist site on the Middle Fork is the only known locality in Idaho for *Thamnolia* and *Cladonia luteoalba*. *Cladonia transcendens* is another uncommon lichen that makes its home on tree trunks, although it is not as rare in Idaho as previously believed. It grows in the canopy and at the base of dead trees or snags. Knowing the zone in the canopy where a species is likely to occur is critical when surveying. Fortunately canopy lichens can often be found in fallen tree litter, particularly after a storm. This is sometimes the only way to identify which species are restricted to the canopy zone.

## **2) Rock outcroppings:**

I would now like to discuss rock outcroppings, which are special or unique habitats in their own right. On talus slopes one could find *Cladonia uncialis*, which occurs in Idaho on a north-facing slope in the waterfall spray zone at Post Falls. This cold boreal site is the only known locality in the Pacific Northwest, but the species is common in the Canadian Rockies (Goward and Ahti 1997).

*Pilophorus acicularis* is found in northern Idaho on rocks, usually on basalt in forest openings. It is related to *Cladonia*. There are two known sites in Idaho, although it is common west of the Cascade Mountains. This lichen has stalks with large, dark globose apothecia on the ends, giving it the appearance of small nails. It is often difficult to photograph because the color is determined in part by the chemical composition of the acids in the lichen.

Another rare rock lichen that occurs in the northern Idaho maritime-influenced climate is bulls-eye lichen, *Placopsis gelida*. It is a crustose species with brown structures and green fuzzy soredia. Brown structures are cyanobacteria in special morphological units called cephalodia. *Placopsis* can colonize sterile rocks and prefers basalt as a substrate. It occurs in a narrow elevational band along the Little Salmon River where *Bryoria tortulosa* occurs.

## **3) Rangelands:**

Idaho rangelands are threatened by wildfires, agricultural expansion, and livestock grazing. These disturbances typically displace native vegetation and result in an increase in cheatgrass or other exotics (Rosentreter 1994). This degradation has occurred over millions of acres in the southern portion of the state. Concomitantly, the lichen flora has also been diminished. Some of the rare soil crusts in Idaho rangelands include *Buellia elegans*, which grows on calcareous soils along the main Salmon River near Lucile Cave. *Dermatocarpon lorenzianum* is known from stiff sagebrush (*Artemisia rigida*) sites where it grows on rocks surrounding the sagebrush covered mounds. Its reproductive structures are called perithecia, which are sunken into the thallus

rather than raised above it like an apothecia. This *Dermatocarpon* is known from one site in Europe (Bruess and McCune 1994), a historic California locality, and one site in Idaho, where it was unknown until 1993. The Idaho site is within Buckwheat Flats Research Natural Area, a BLM administered area north of Weiser.

The blue-colored lichen, *Pannaria cyanolepra*, occurs within several old-growth sagebrush communities in Idaho. It may actually represent an undescribed species. Whatever the species is determined to be, it appears closely associated with old-growth sagebrush sites, as does *Trapeliopsis wallrothii*. *Trapeliopsis* is only known from a few good condition sagebrush habitats in Idaho, Oregon, and Washington. In other less shrubby rangeland sites, *Xanthoparmelia neochlorochroa*, commonly known as "range lichen," occurs in badlands within the sagebrush zone. *Xanthoparmelia idahoensis* occurs near the town of Salmon (Hale 1990), where it is subject to off-road vehicle impacts. It can be distinguished by a lack of rhizines on the undersurface and its erect growth form relative to other species of range lichen. Also found in rangelands is tumbleweed lichen, *Aspicilia fruticulosa*. Tumbleweed lichen was reported as new for North America in 1993 (Rosentreter 1993). It occurs on calcareous rangelands which are limited in the west. It is uncommon, but I expect more localities to be found as we continue to look for the species. To date, it has not been reported from eastern Oregon and appears to be rare or absent in Utah as well.

#### 4) Alpine:

In the alpine one may be lucky to find *Brodoa oroarctica* or *Solorina crocea*. These species occur in Idaho's Sawtooth and Selway-Bitterroot Mountains. *Brodoa* looks like a *Hypogymnia* but it has hyphae on the inside rather than being hollow and inflated. *Solorina* is a soil-occurring lichen with a distinctive orange medulla. There might also be *Thamnolia vermicularis*, which, as mentioned earlier, is known from one mid-elevation site on the Middle Fork of the Salmon River with *Cladonia luteoalba*. Its typical habitat is alpine however. Lichen rarity in Idaho's alpine is probably more an artifact of the minimal attention these habitats have received by lichenologists than their true status. They are wonderful places to explore though, and much work remains to be done.

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